

## CLAIMS

1. A radio station connected, by wire, to a first wire network composed of plural communication terminal equipments connected to each other by wire and connected, by radio, to a second wire network composed of plural communication terminal equipments connected to each other by wire, and adapted for transmitting/receiving communication data packets,

the radio station comprising:

identification packet generating means for generating identification packet having a predetermined form of the communication data packets;

wireless communication means for transmitting/receiving the communication data packets between the wireless communication means and the second wire network;

wire communication means for transmitting/receiving the communication data packets between the wire communication means and the first wire network;

identification packet detecting means for detecting the identification packet generated at the identification packet generating means; and

control means for controlling the identification packet generating means to generate the identification packet, and for controlling the identification packet detecting means to detect the identification packet.

2. The radio station as set forth in claim 1, wherein the control means changes communication mode (form) in the wireless communication means when identification

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packet is detected at the identification packet detecting means.

3. The radio station as set forth in claim 2, which comprises selector means for selecting wireless communication channel used for transmitting/receiving operations of the communication data packet from plural wireless communication channels,

wherein the control means selects the wireless communication channel at the selector means to thereby change communication mode.

4. The radio station as set forth in claim 2, which comprises ciphering means for enciphering, on the basis of cipher key, communication data packet transmitted/received by radio between the ciphering means and the second wire network,

wherein the control means changes the cipher key at the ciphering means to thereby change communication mode.

5. The radio station as set forth in claim 1, wherein the communication data packet includes a wire destination address portion indicating communication terminal equipment serving as destination of the communication data packet of the plural communication terminal equipments within the first wire network and the plural communication terminal equipments within the second wire network, and a wire transmit source address portion indicating communication terminal equipment of transmit source of the communication data packet, and

wherein the identification packet detecting means sets the same address with

respect to the wire destination address portion and the wire transmit source address portion.

6. The data station as set forth in claim 5, wherein the wire destination address portion and the wire transmit source address portion are respectively addresses of the data station.

7. The data station as set forth in claim 1, which comprises wireless address adding means for adding wireless destination address portion indicating destination when transmitting/receiving operations are carried out by radio and wireless transmit source address portion indicating transmit source when transmitting/receiving operations are carried out by radio to communication data packet sent out from the wireless communication means to the second wire network.

8. The radio station as set forth in claim 7, wherein the wireless destination address

portion of the identification packet is broadcast addresses in which respective ones of plural communication terminal equipments connected to the radio station and respective ones of plural communication terminal equipments connected to the wire network are caused to be destination.

9. A data packet transmitting/receiving method of transmitting/receiving communication data packets by radio between a first radio station connected to a first wire network composed of plural communication terminal equipments connected to

the data packet transmitting/receiving method comprising:

- an identification packet generation step in which the first radio station generates identification packet having a predetermined form of the communication data packets;
- a transmitting step in which the first radio station transmits the identification packet generated at the identification packet generation step into the first wire network or to the second radio station;
- a discrimination step in which the first radio station discriminates as to whether or not communication data packet received from the second radio station or the first wire network is the identification packet; and
- a step in which in the case where the communication data packet is the identification packet, the first radio station changes communication mode between the first radio station and the second radio station.

thus to change communication mode on the basis of the wireless channel

selected at the selection step.

11. The data packet transmitting/receiving method as set forth in claim 9, which comprises a ciphering step of enciphering the communication data packet on the basis of cipher key,

thus to change communication mode on the basis of the cipher key used at the ciphering step.

12. The data packet transmitting/receiving method as set forth in claim 9, wherein,  
at

the identification packet generation step, the identification packet is generated in a manner including wire destination address portion indicating communication terminal equipment serving as destination of the communication data packet and wire transmit source address portion indicating communication terminal equipment of transmit source of the communication terminal equipments connected to the first wire network and the second wire network, thus to set the same address with respect to the wire destination address portion and the wire transmit source address portion.

13. The data packet transmitting/receiving method as set forth in claim 9, wherein,  
at

the transmitting step, when the identification packet is transmitted to the second radio station, wireless destination address portion serving as destination when transmitting/receiving operations are carried out by radio and wireless transmit source

address portion serving as transmit source when transmitting/receiving operations are carried out by radio are added to the identification packet.

14. A communication data packet transmitted/received by radio between a first radio

station connected to a first wire network composed of plural communication terminal equipments connected to each other by wire and a second radio station connected to a second wire network composed of plural communication terminal equipments connected to each other by wire,

the communication data packet including:

a destination address signal in which destination address indicating transmit destination indicates all communication terminal equipments connected to the first wire network and the second wire network;

a wireless transmit source address signal indicating communication terminal equipment of transmit source when transmitting/receiving operations are carried out by radio;

a wire destination address signal indicating communication terminal equipment of transmit destination of the plural communication terminal equipments connected to the first wire network and the second network; and

a wire transmit source address signal indicating communication terminal equipment of transmit source of the plural communication terminal equipments

connected to first wire network and the second wire network,

wherein the wire transmit source address signal is the same as the wire destination address signal.

15. The communication data packet as set forth in claim 14, wherein the wire destination address signal is address of the data station which sends out the communication data packet.

16. A wireless network system of transmitting/receiving communication data packets

between a radio station connected to a first wire network composed of plural communication terminal equipments connected to each other by wire and a radio station connected to a second wire network composed of communication terminal equipments connected to each other by wire,

wherein the radio station comprises identification packet generating means for generating identification packet which is communication data packet having a predetermined signal form, and identification packet detecting means for detecting the identification packet from the communication data packets.

17. The wireless network system as set forth in claim 16, wherein communication mode between the radio station connected to the first wire network and the radio station connected to the second wire network is changed on the basis of detection result of the identification packet detecting means.

18. A wireless network apparatus adapted for carrying out, by radio, transmission of communication data packets between a first wire network and a second wire network,

the wireless network apparatus comprising:

loop detection packet generating means for generating the communication data packet of a predetermined form for detecting loop of the communication data packet; and

detecting means for detecting the loop detection packet from received communication data packet.

19. The wireless network apparatus as set forth in claim 18, wherein communication mode is changed on the basis of detection result of the detecting means.

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